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Chapter 16: D & C Manager

Overview

The Design and Computation Manger (D & C Manager) has become a very integral part of the design process. Plan view elements such as edges of pavement, centerline, curb and gutter, walls, and guardrail must be drawn into a design file with the assigned attributes, conforming to agency drafting standards. Drawing plan view elements using D&C manager is vital for the use of FLH X30 criteria, automating quantities and plotting. GEOPAK's D & C manager is the tool that automates tasks through the use of a hierarchical database, **.ddb**, containing information about each element to be placed within a set of plans.

The FLH X30 criteria file uses two FLH wide .ddb files. An English and Metric versions (**V8_ENGLISH.ddb & V8_METRIC.ddb)** of the database is available for use with their respective projects. Each **.ddb** file is broken into 5 categories: **CHAINS/PROFILES, MVBA Applications, 3PC, Pay_items, and Define_dgn**. These five categories are then further broken down into the subcategories and into individual items.

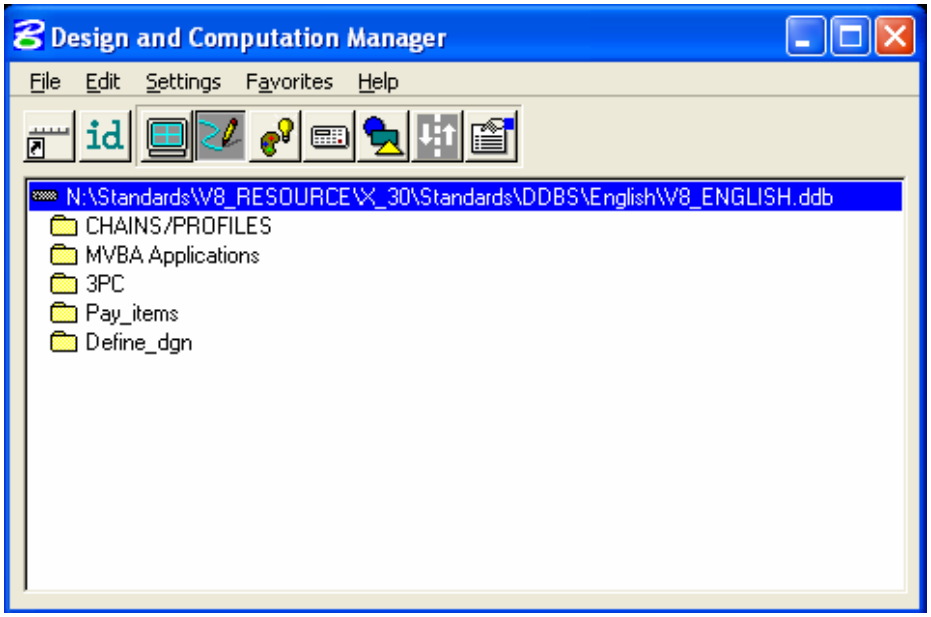


Figure 16-1: Design and Computation Manager

DDB FILES

The .ddb files can be found on the CFLHD network at:
N:\Standards\V8_Resource\X_30\Standards\DDBS\English or Metric\

STANDARDS FOR USE WITH X30 CRITERIA

For CFLHD employees, the unit correct .ddb file will be automatically attached while opening a design file using the Project Configuration (*.pcf). Workflow 1, shown below, can be used to manually attach a .ddb file.

For consultants, .ddb files are available through the **V8_Resource.zip** download. Download V8_Resource.zip file and extract the files to the server or local drive, keep the V8_Resource directory structure intact. The unit correct .ddb file will be attached when opening a design file using the project configuration file.

Workflow 1, shown below, can be used to manually attach a .ddb file to a design file.

Workflow 1: Attaching a .ddb File

1. *Access the D&C Manager by selecting the D&C Manager icon from the GEOPAK Road tool frame as shown below.*

Figure 16-2: Access D&C Manager

2. *Or by selecting Applications>GEOPAK Road>Design and Computation Manager, as shown below. Once accessed, two dialog boxes appear. The main D&C Manager dialog box and a secondary dialog showing various D&C Manager options.*

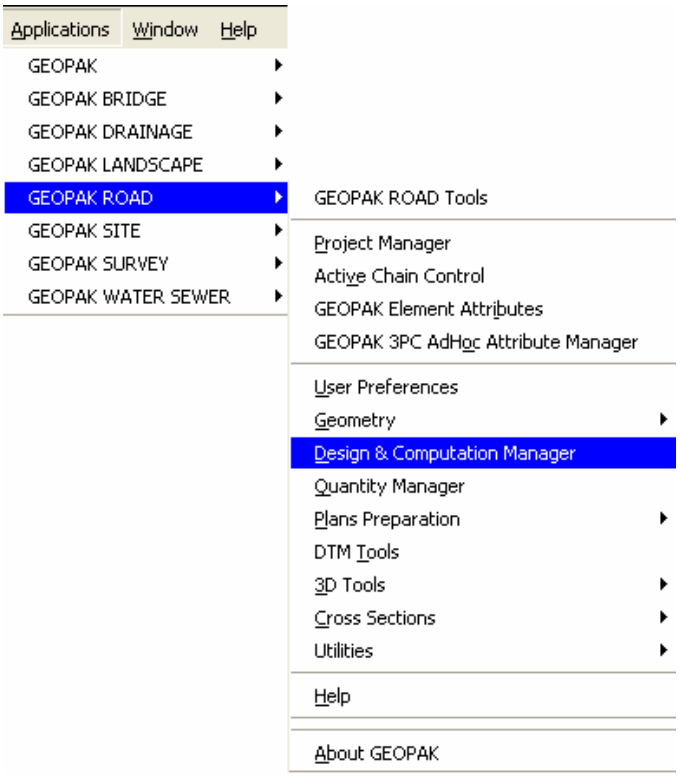


Figure 16-3: Access D&C Manager

3. From the D&C Manager dialog select File>Open.

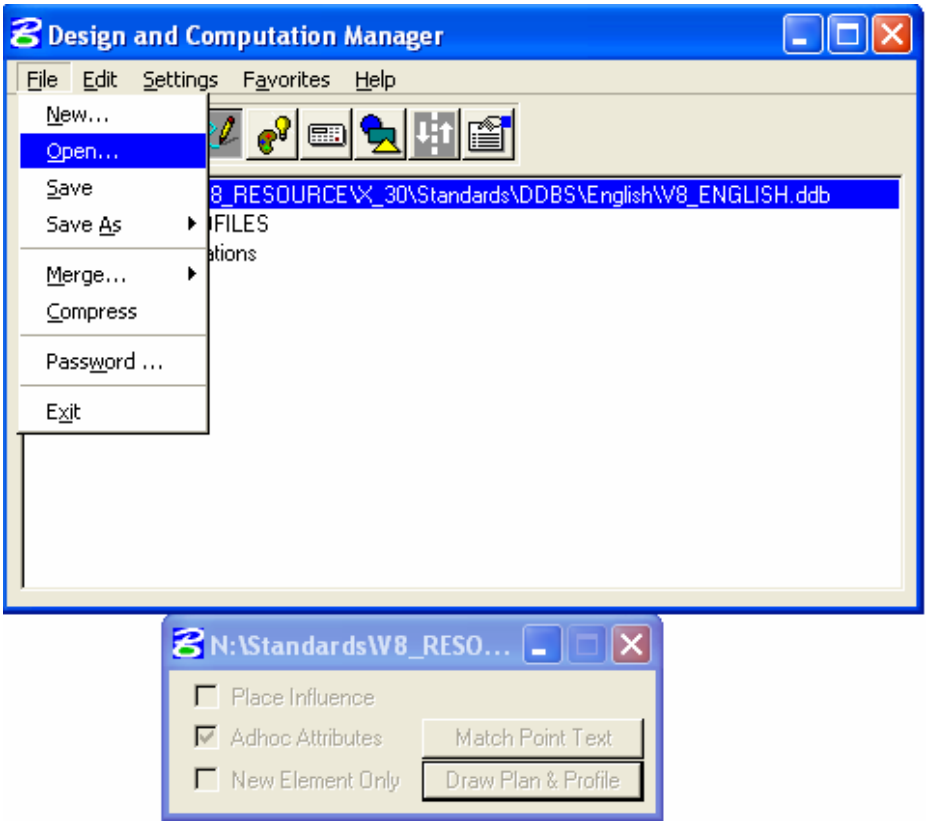


Figure 16-4: Open Database

4. *Select the .ddb file specific to the units of the current project from the DDBS directory.*

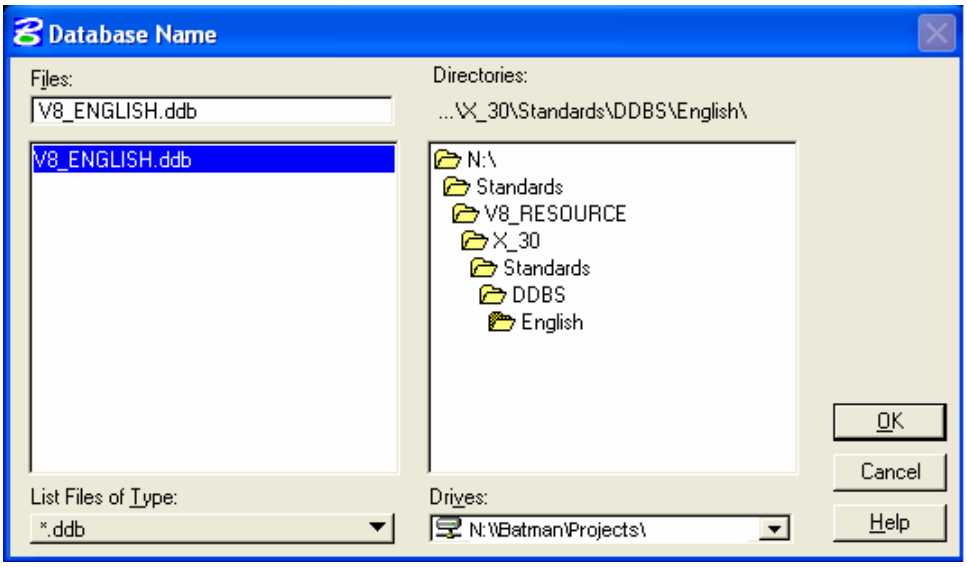


Figure 16-5: Select CFLHD Database

5. *Select OK, the correct .ddb file will now be attached.*

Using the D & C Manager

As stated in chapter 11, this manual is not intended to teach the use of GEOPAK to the novice user. However, the following workflows will outline the most important uses of the D & C Manager, and their importance to CFLHD. There are two types of information drawn by the D & C Manager; elements such as centerlines, which have been stored in the coordinate geometry database, and elements such as shoulder lines, which have not been stored.

Workflow 2: Drawing Elements Stored in Coordinate Geometry Database

1. *Once a chain, profile, or other coordinate geometry element has been stored in the coordinate geometry database, it will be drawn into MicroStation using the D & C Manager's Draw Plan and Profile tool. From the D & C Manager dialog box, select the type of element to be placed from the CFL/EFL subdirectory. Make sure the Design mode button, as shown below is selected.*

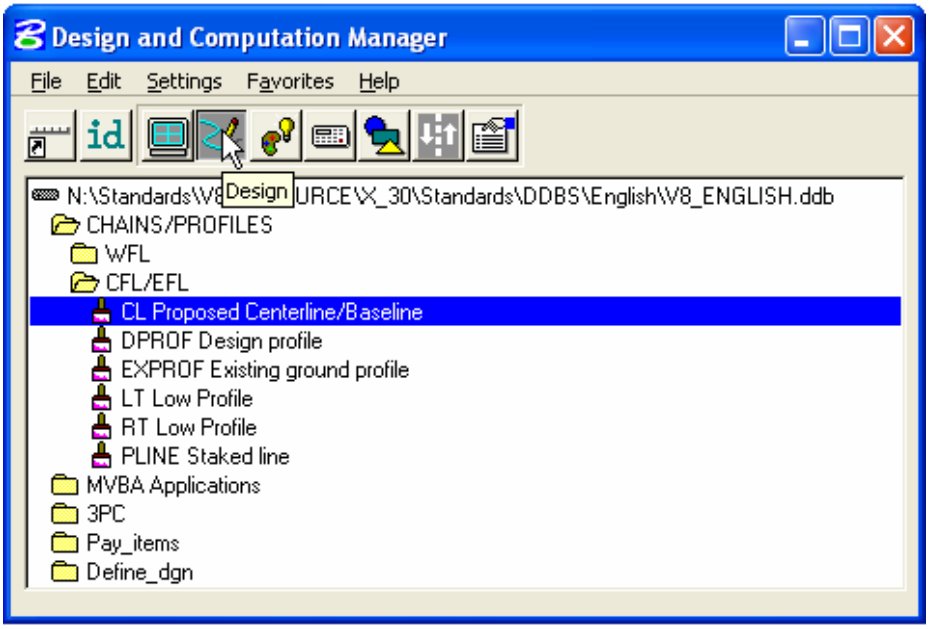


Figure 16-6: Select Database Item

The item has all of the attributes, as determined by CFLHD needed to draw the element into MicroStation. Each item has been created with the correct level, color, weight, and style, for use with FLH X30 criteria, quantities, etc. The task of creating all of this information has already been done by CFLHD. It is password protected and cannot be modified by the user.

2. *Once the correct element has been selected, the secondary D&C Manager dialog will become active, select the Draw Plan and Profile button in the secondary D&C Manager dialog.*

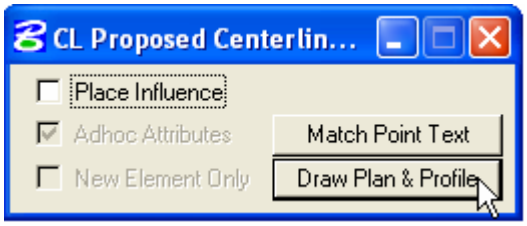


Figure 16-7: Draw Plan and Profile Dialog

3. *Selecting the Draw Plan & Profile will activate the Open Job dialog box; user must select the .gpk file for the project. Select OK.*

Figure 16-8: Open Job

4. *Selecting OK will activate the dialog box shown below, allowing the user to select the desired COGO element, shown on the left side of the dialog box. The list of elements shown in this box will correspond to the category set by the operation button in the upper left corner of the dialog box. Categories include Chains, Stationing, Lines, Curves, Spirals, and Points.*

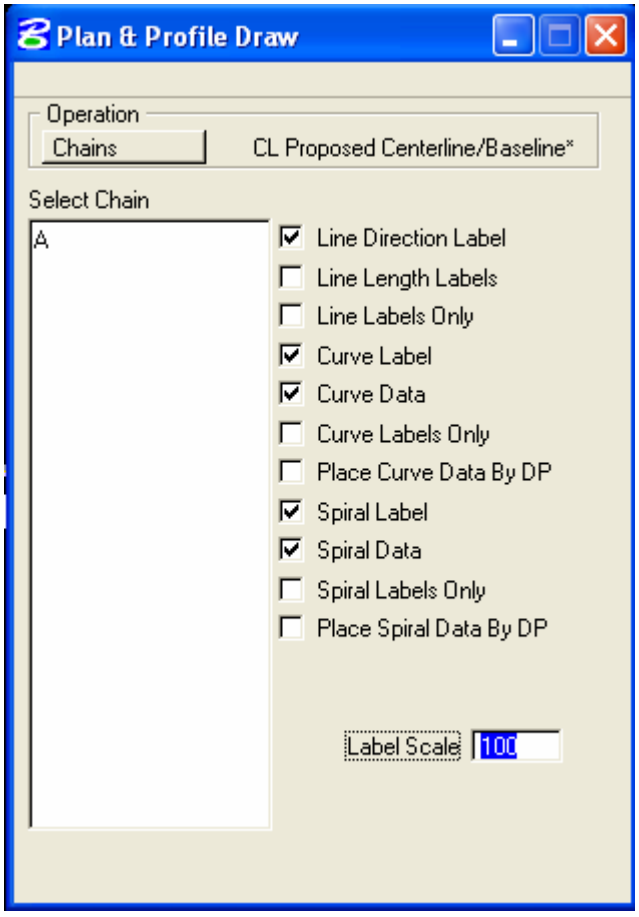


Figure 16-9: Select Chain

5. *The various types of annotation that can be placed with the active category of COGO element are listed along the right side of the dialog box as a series of check boxes. The default setup of these check boxes has been determined by CFLHD. The information to be placed, in this case, Line Direction Label, Curve Label, Curve Data, Spiral Label, Spiral Data, is what CFLHD expects to see on a*

typical project. As such, for stationing annotation to CFLHD, these toggles must not be changed. For preliminary work, this toggle may be turned on/off as needed.

6. *The Label Scale field in the lower left corner of the dialog controls the size of text and graphic annotation for the selected coordinate geometry category. The value in this field corresponds to the plot scale on 11x17 size plan sheets where the elements will be used. For example, if D&C Manager is being used to draw a chain for a Metric unit project that will be used for 1000:1 scale plan sheets then the value in the Label Scale field should be 1000. Similarly, if D&C Manager is being used to draw a chain for an English unit project that is being used for 100' = 1" plan sheets then the value in the Label Scale field should be 100.*

For the Stationing category there are a limited number of values that are allowable in the Label Scale field. For Metric units stationing the allowable values for Label Scale are 50, 100, 200, 250, 300, 400, 500, 1000, and 2000. For English units stationing the allowable values for Label Scale are 10, 20, 40, 50, 100, and 200. If a value other than those listed is used for the Stationing category no stationing will be drawn.

7. *Select the coordinate geometry element to draw by single clicking on it in the list box along the left side of the dialog. The element will be immediately drawn into the active design file.*

When drawing a chain into MicroStation, select the desired chain only once. It will plot immediately upon selection. If the plotted chain is not visible, use MicroStation fit view to fit the chain into the MicroStation window.

Workflow 3: Drawing New Design Elements

Placing elements into a design file, which have not been stored in the coordinate geometry database, will be drawn using the D & C Manager. The FLH X30 criteria files search for plan graphic elements placed with the correct D & C Manager attributes, when creating the proposed cross-sections. The plan graphic elements used by the criteria to draw the proposed cross sections have intelligence; these intelligent plan graphic elements are known as **Adhoc**. On certain D&C Manager elements used by the criteria the user has the option of assigning adhoc to the element in order to directly control the criteria. The adhoc options will become visible to the user, when an item is selected with the Adhoc Attribute toggled on in the Secondary D & C Manager dialog box. Any changes to the default adhoc attribute

values can be made at the time when the plan graphic element is placed or the adhoc may be changed later using the Adhoc Attribute Manager and the Set Command.

The D & C Manager can be used in conjunction with both MicroStation commands, such as move parallel and place line, and GEOPAK commands, such as draw transition. When drawing plan graphics using D & C Manager, always turn on Place Influence and Adhoc Attribute toggles in the secondary D & C Manager dialog.

1. *From the D & C Manager dialog box, select the Define_dgn Category as shown below.*

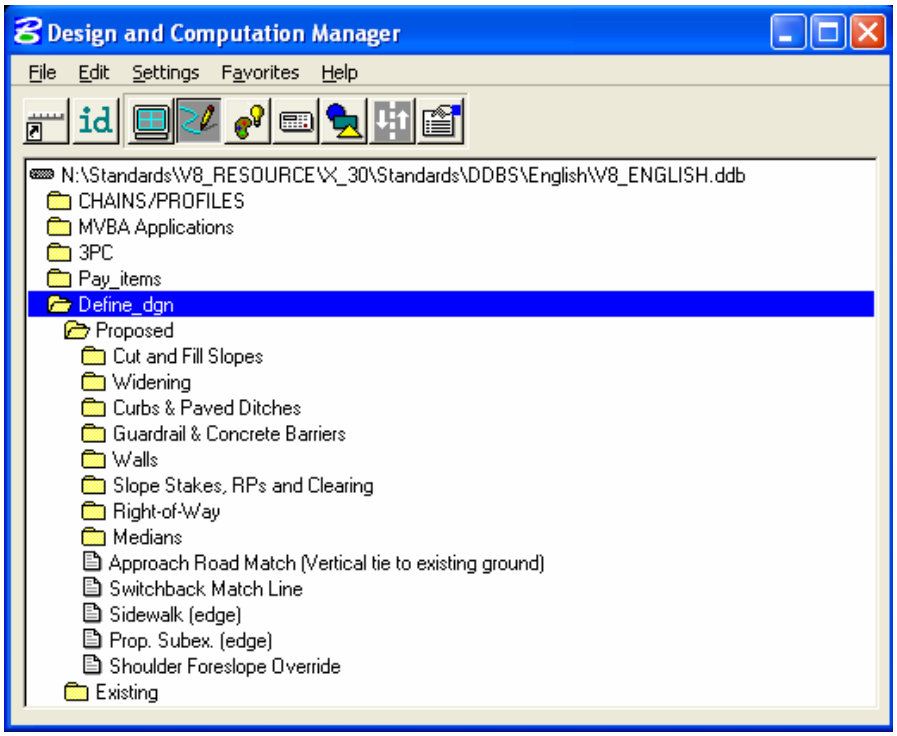


Figure 16-10: Select Define_dgn Category

Define_dgn category is broken into 2 subcategories: Proposed and Existing. In the proposed subcategories contains all the proposed plan view elements and in the existing subcategory contains all the existing plan view elements. Existing subcategory will be used to draw supplemental mapping features.

Proposed plan view elements drawn with the unit specific .ddb file is vital to the development of cross sections.

2. *For example, from the Proposed subcategories> select Walls. In the Walls subcategory multiple walls are available. For example, select the Prop. MSE Wall. When drawing new elements, make sure the Design mode button is selected.*

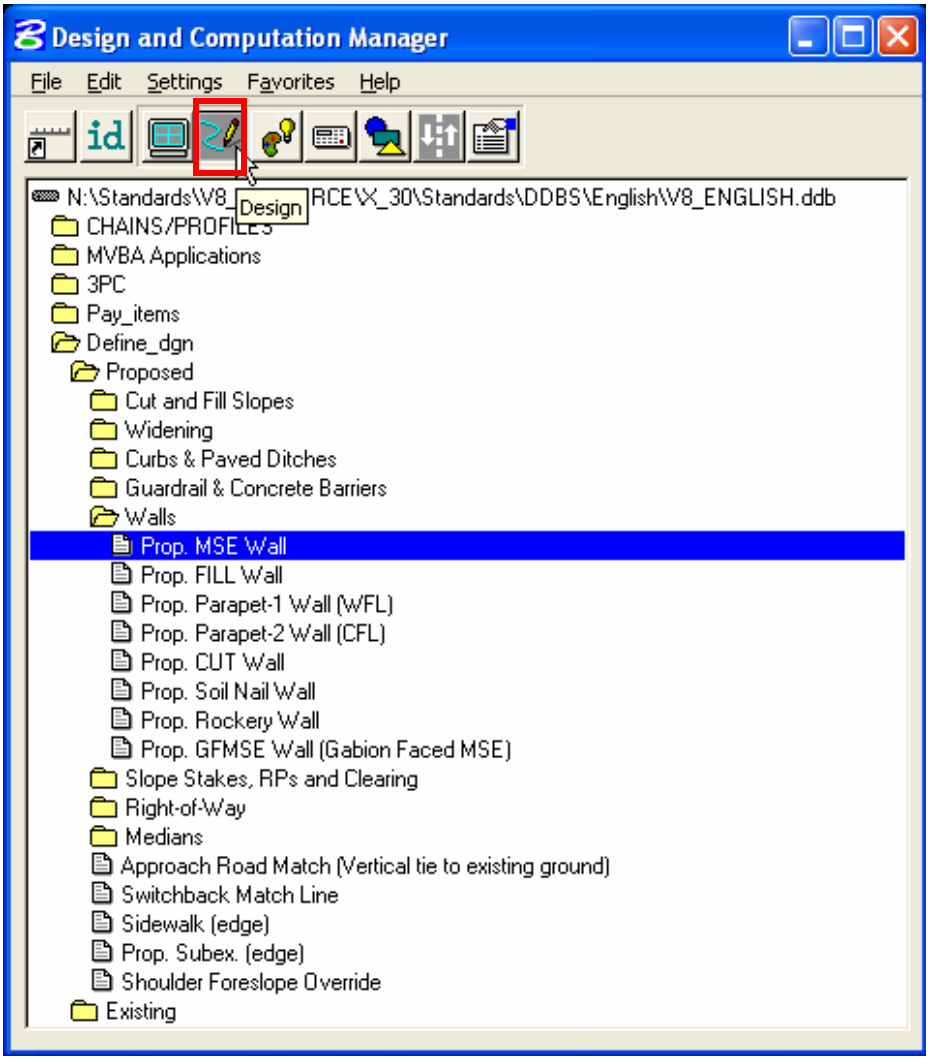


Figure 16-11: Select Proposed MSE Wall

3. *Always toggle on Place Influence and Adhoc Attributes in the secondary D&C Manager dialog. New Element only can be toggled on when creating only new elements.*

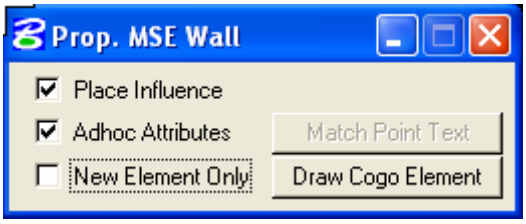


Figure 16-12: Place Influence & Adhoc Attribute

Toggling on place influence will allow the user to place any element with the attributes assigned to the element in the D & C Manager. With the Adhoc Attributes toggled on, GEOPAK will give the new or modified element the same adhoc values as the active item. With new element only toggled on, any modifications to a selected item will not result in changing the attributes of that element. In the example

above, a line drawn using MicroStation's place line command will be drawn with the attributes of **Proposed MSE Wall**.

4. *Toggling on the Place Influence and Adhoc Attribute will invoke the adhoc attribute dialog box for the proposed MSE Wall.*

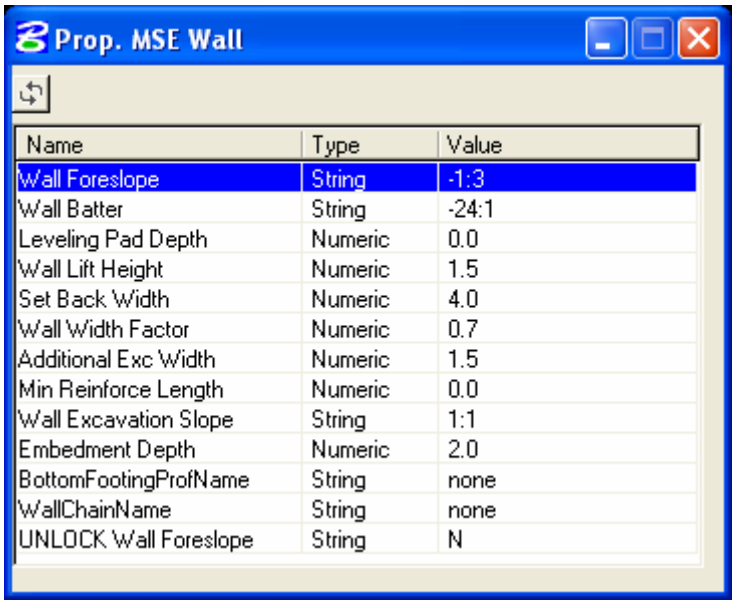


Figure 16-13: Proposed MSE Wall Adhoc Attribute table

If the D&C Manager item selected has adhoc attributes assigned to the item, then the default adhoc attributes dialog box will be pop up, allowing the user to enter project specific values. Adhoc attributes are programmed with default values and can be modified to accommodate the different projects. Click here to See CFL HD Adhoc Default Preferences that are different than the standard adhoc attributes.

5. *Once the default MSE Wall adhoc attributes have been modified for a project access the Draw Transition tool as shown below. Applications>Geopak Road>Plan Preparation>Draw Transition*

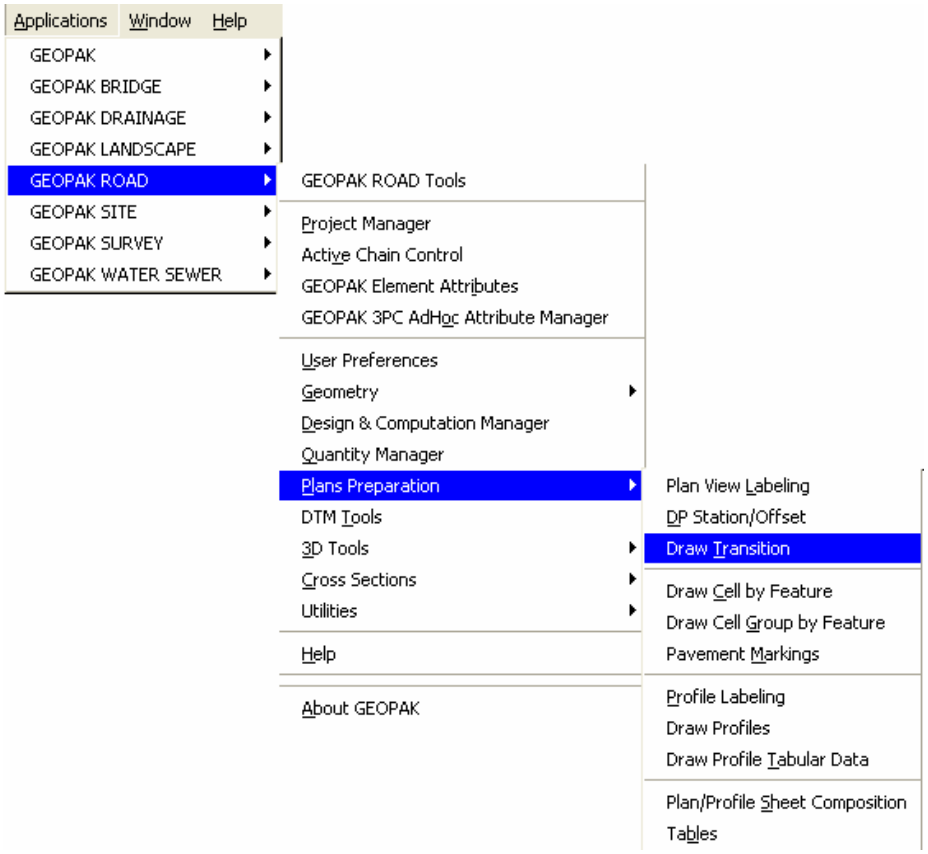


Figure 16-14: Access Draw Transition

Draw transition tool provides accuracy and efficiency when drawing plan graphic elements. Draw transition tool is recommended over the copy parallel command. If copy parallel command is not used properly, with the correct Mode: Original can result inaccurate plan graphic elements.

6. *Populate the Draw Transition dialog for the project and select DRAW to place the Proposed MSE wall into Plan view.*

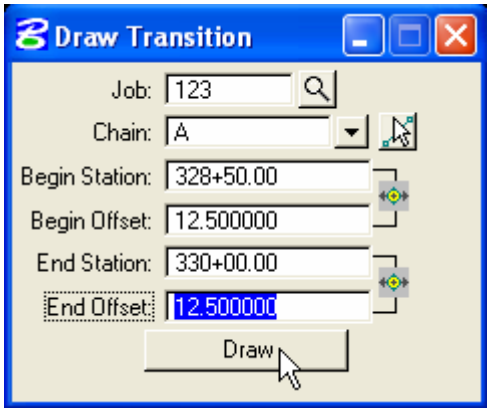


Figure 16-15: Draw Transition

Changing Adhoc Attributes

Once an element has been drawn to the plan view using D & C Manager, it may be desirable to revise certain adhoc values. Adhoc values can be changed using the GEOPAK 3PC ADHOC Attribute Manager.

1. From the MicroStation Menu Select **Applications > GEOPAK ROAD > GEOPAK 3PC Adhoc Attribute Manager.** The following dialog box will appear. Select the Identify Element icon to identify the plan element that contains the adhoc(s) to be revised.

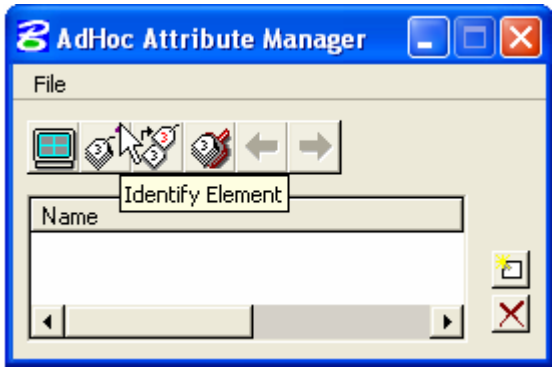
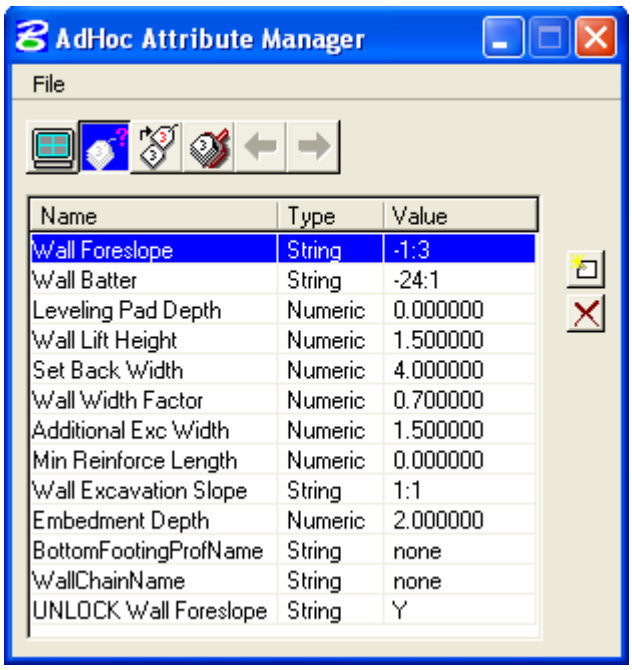


Figure 16-16: Adhoc Attribute Manager

2. Select the plan element with a left mouse click to populate the dialog with the current adhoc attributes of the element. For example an MSE Wall plan element is selected. The dialog will be populated with adhoc attributes as shown below:



Name	Type	Value
Wall Foreslope	String	-1:3
Wall Batter	String	-24:1
Leveling Pad Depth	Numeric	0.000000
Wall Lift Height	Numeric	1.500000
Set Back Width	Numeric	4.000000
Wall Width Factor	Numeric	0.700000
Additional Exc Width	Numeric	1.500000
Min Reinforce Length	Numeric	0.000000
Wall Excavation Slope	String	1:1
Embedment Depth	Numeric	2.000000
BottomFootingProfName	String	none
WallChainName	String	none
UNLOCK Wall Foreslope	String	Y

Figure 16-17: MSE Wall Adhoc Attributes

3. Revise the value of the adhoc(s) in the dialog to the new desired value by clicking on the current adhoc setting and type in a new value and press enter or tab to accept the change. Select the icon entitled "Set Attributes" and then left mouse click on the plan element(s) that require the change.

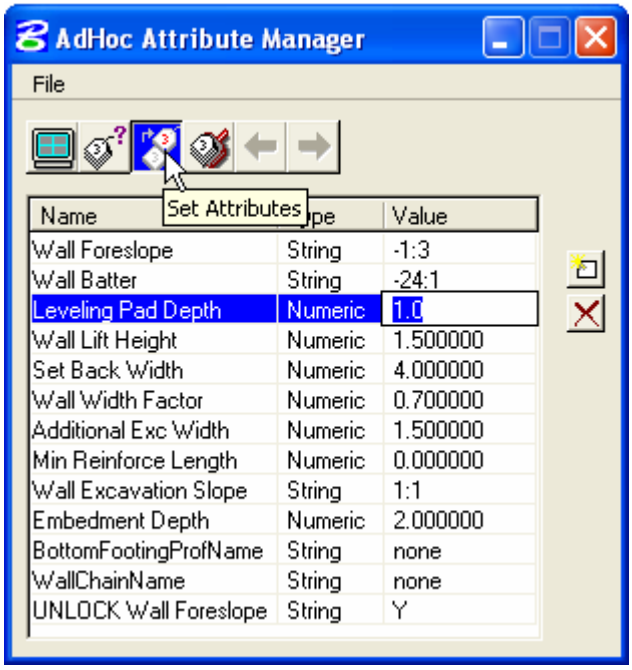


Figure 16-18: Edit MSE Wall Adhoc Values

The ability to change the value of an adhoc attribute as shown above will NOT work if D & C Manager is opened and Place Influence is turned on. Make sure before changing adhoc value(s) on previously drawn elements that the place influence is turned OFF.

Scale Factor for Custom Line Styles in D & C Manager

If the design element (ddb item) selected from the D & C Manager has custom line styles associated with the element, then a scale factor must be set prior to drawing the design element.

From the D & C Manager Dialog Box, Select *Settings>Design*

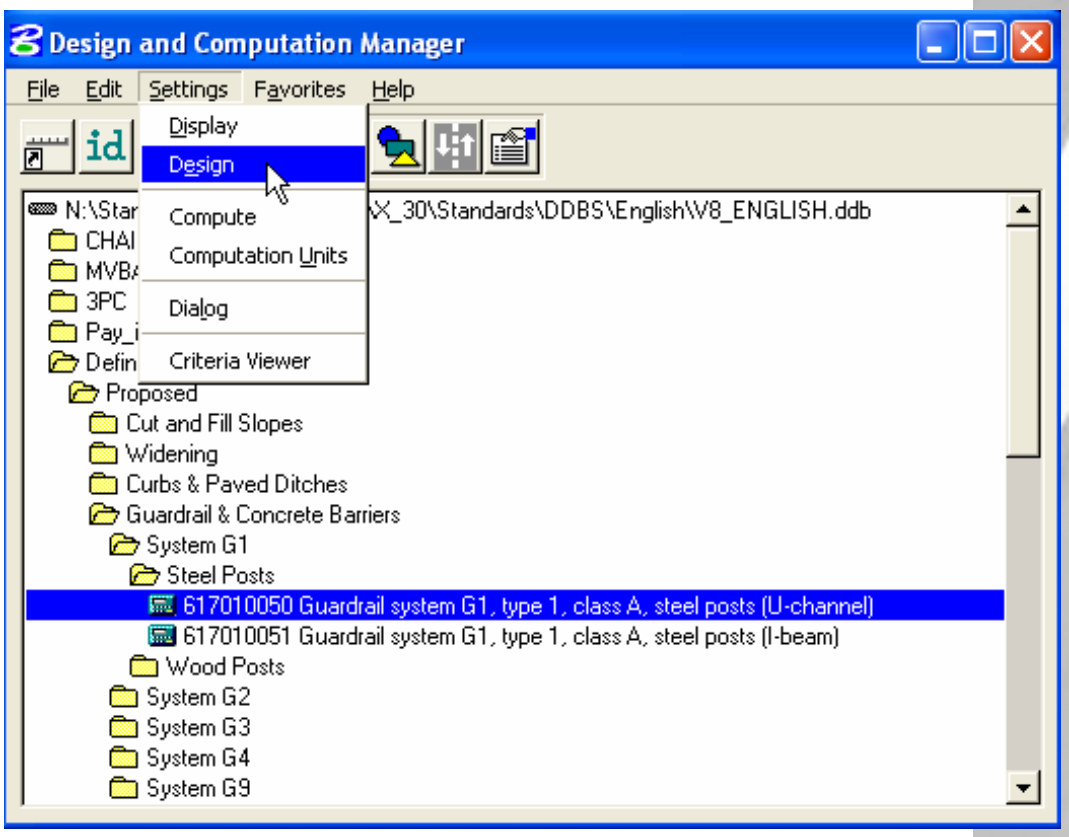


Figure 16-19: Design Settings

Modify the Custom Line Style Creation Scale Factor based on the scale of your plan drawing. For CFLHD projects, use scale factors shown below. After the Scale Factor has been modified, all the custom line styles drawn using the D & C Manager will have the new scale until changed by the user. Custom Line Style Creation Scale Factor can be changed in the Design Mode as well as in the Set Mode in the D&C Manager.

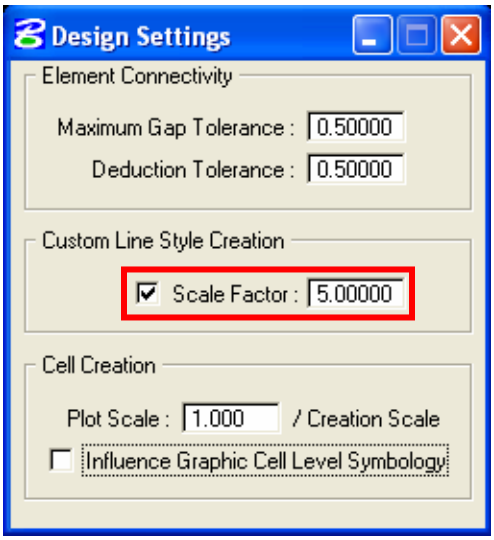


Figure 16-20: Custom Line Style Scale Factor

For CFLHD projects, Use the following Scale Factors:
1"=100' English Plans
Scale Factor =5 (Exception: Concrete Barrier =2.5)
1:1000 Metric Plans
Scale Factor =2 (Exception: Concrete Barrier =1)
For different scale plans, adjust scale factor accordingly.

Workflow 4: Changing Existing Design Elements

The Set mode in D & C Manager is used to change the attributes and symbology of an existing element to the attributes of another D & C Manager item, eliminating the need to redraw an element(s) from scratch.

1. *Select the Set mode icon and choose the new D&C manager item that will replace the existing element. For the example, Guardrail System G1 will replace the existing element previously drawn in the dgn file.*

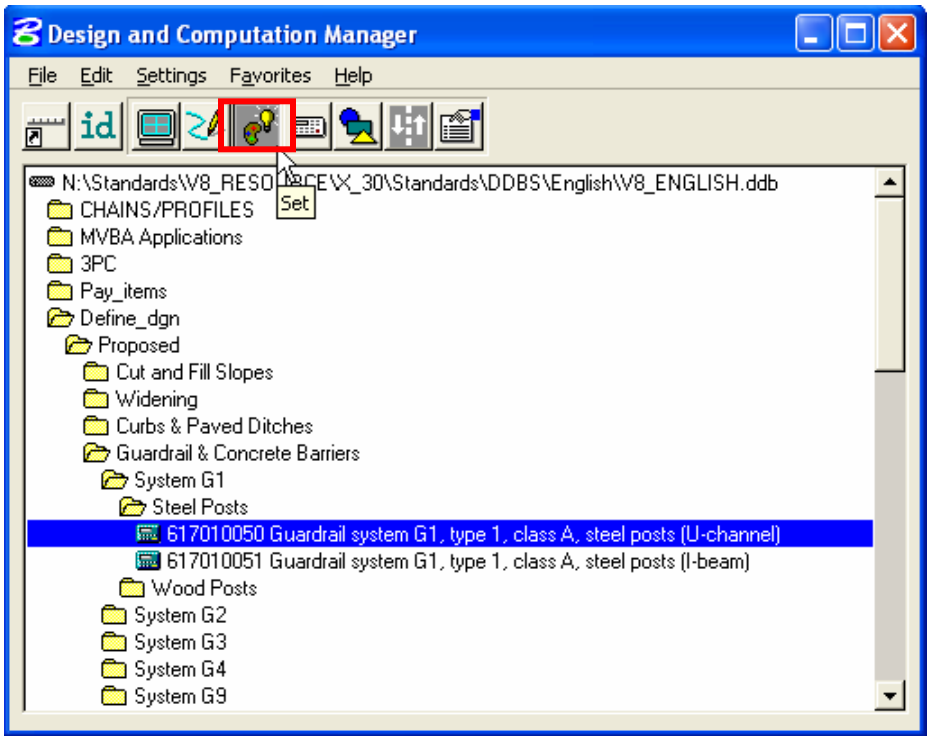


Figure 16-21: Set Mode to draw Proposed Guardrail System G1

2. *In the Secondary D&C Manager dialog box, Toggle on the Adhoc attributes and Select the Attach Mode to Replace.*

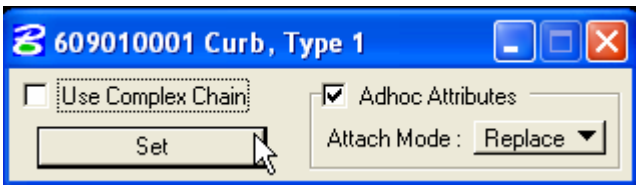


Figure 16-22: D&C Manager Set Mode

3. *Click on the Set Toggle and Identify the existing element to change. Change can be verified by selecting the ID button in the D&C Manager and selecting the element, the redefined element will be highlighted in the D&C Manager dialog box.*

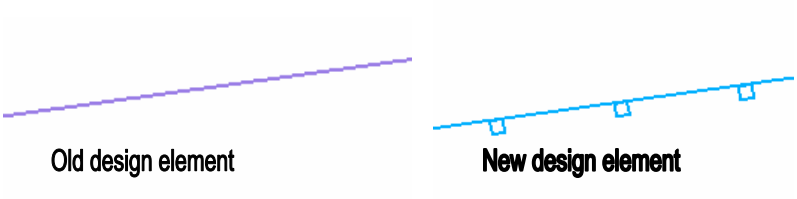


Figure 16-23 Plan Graphic Design Element

Multiple elements can be changed all at once, using MicroStation's Power Selector. Use the Power Selector and identify elements to be changed. Click on Set and all elements selected will be changed to the D&C Manager Item.

Workflow 5: Drawing Pay Item Elements

1. *From the D&C Manager select the element to be drawn from the Pay_items Category. In the example below, use Silt Fence.*

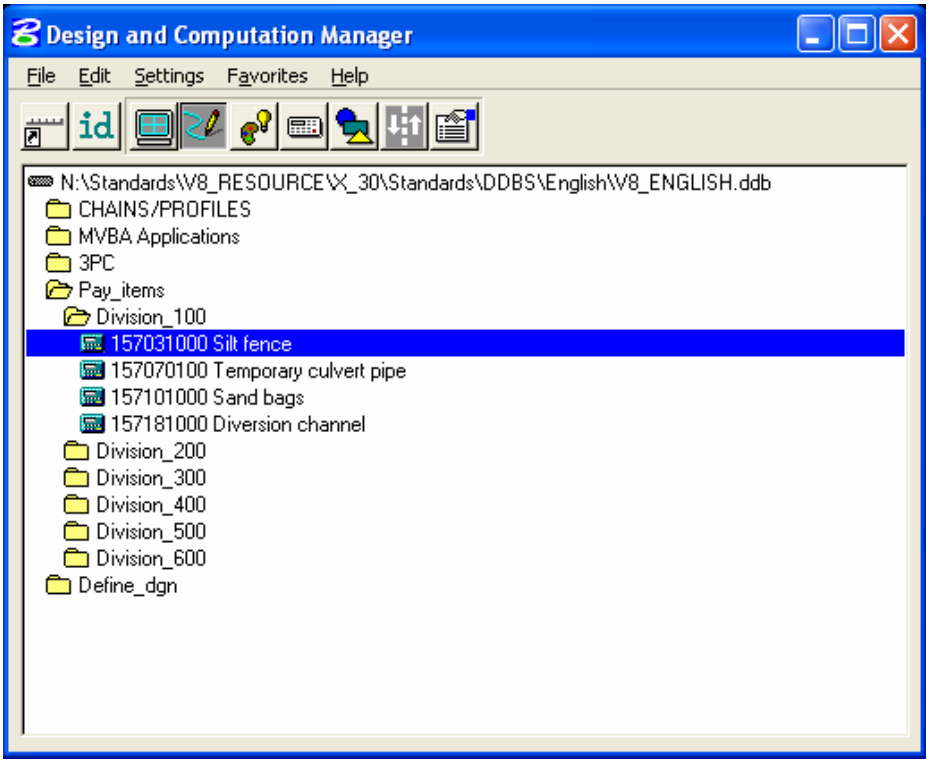


Figure 16-24: Select Database Item

2. *Select the desired MicroStation or GEOPAK tool, in this example, the copy parallel tool.*

The copy parallel tool, when used with out Place Influence toggled, will always place the new element with the symbology of the existing element, regardless of the active attributes. Place Influence over-rides the existing attributes with that of the selected element.

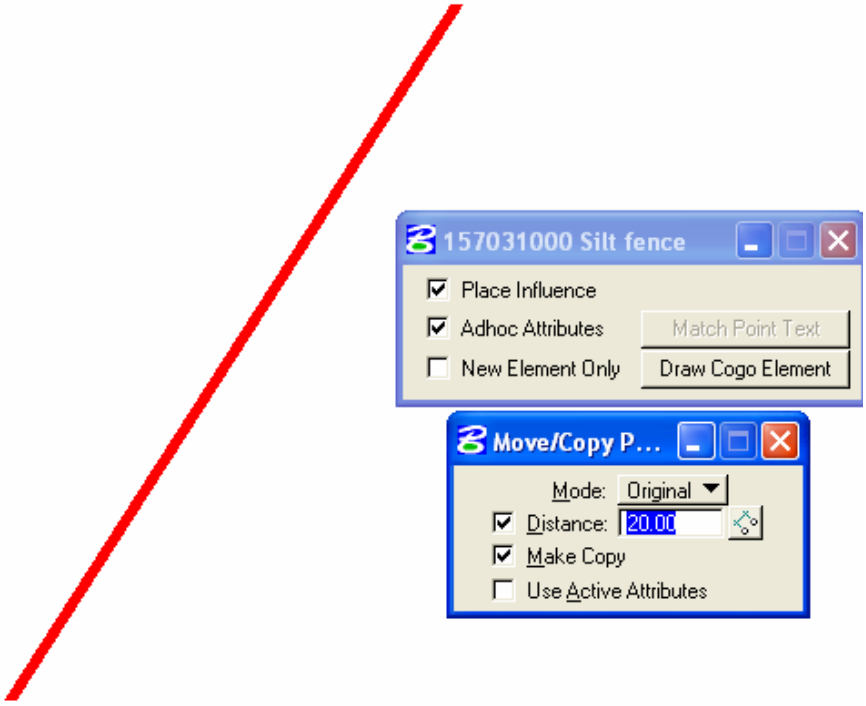


Figure 16-25: Place Influence

3. *With Place Influence toggled on, select the existing element and accept in the desired direction.*
4. *The new element will be drawn with the correct attributes of the element selected in the D & C Manager, regardless of the active MicroStation attributes.*

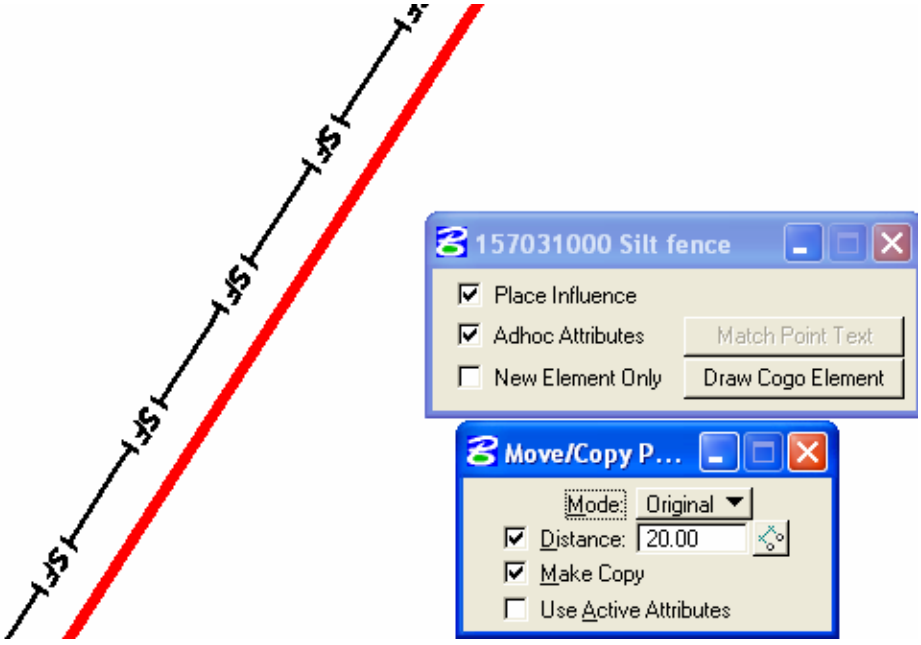


Figure 16-26: Copy Parallel with Place Influence

Information for All Users

Simply setting the active level, color, weight, and style or toggling on the Use Active Attributes button is not the same as using the GEOPAK Place Influence command. The two information dialog boxes shown below are: first, from the element placed with Place Influence toggled on, and, second, without using Place Influence.

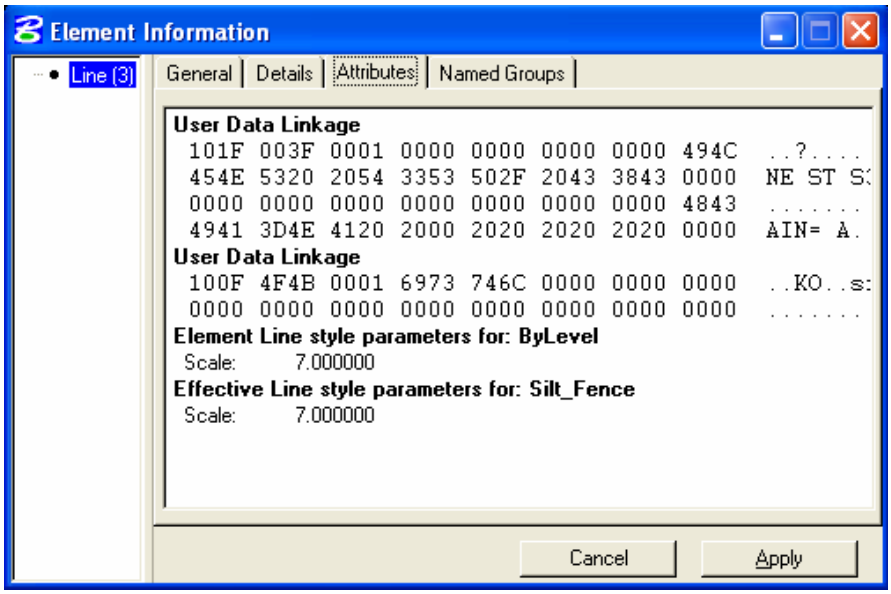


Figure 16-27: Element Information, with Place Influence

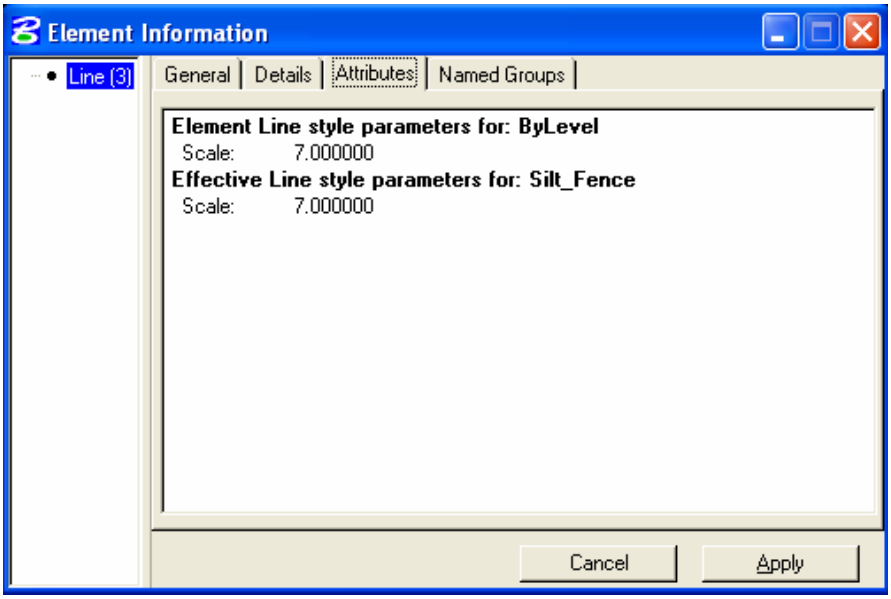


Figure 16-28: Element Information, without Place Influence

As shown above, the element created with place influence has user data linkage attributed to the element. The element created without place influence does not. This extra data is read by GEOPAK for things such as automated quantities, etc.

MicroStation Visual Basic Application in D&C Manager

Several MicroStation Visual Basic Application (MVBA) applications can be launched through the D & C Manager.

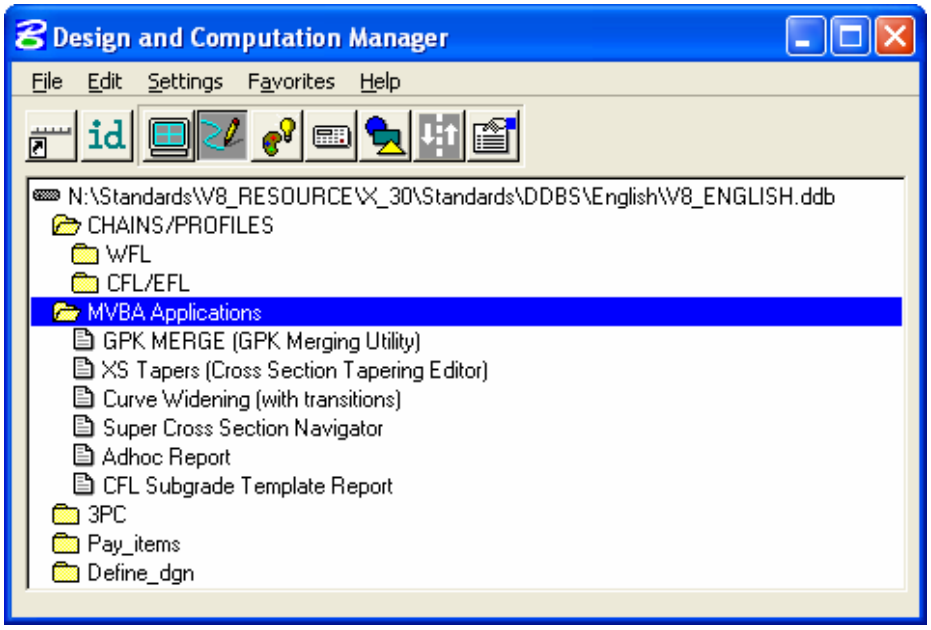


Figure 16-29: MVBA Applications

Listed below are the MVBA available through the D & C Manager and their use.

GPK Merge - This MVBA is GPK Merging Utility that can merge two GPK files, by the categories defined on the left side of the dialog box.

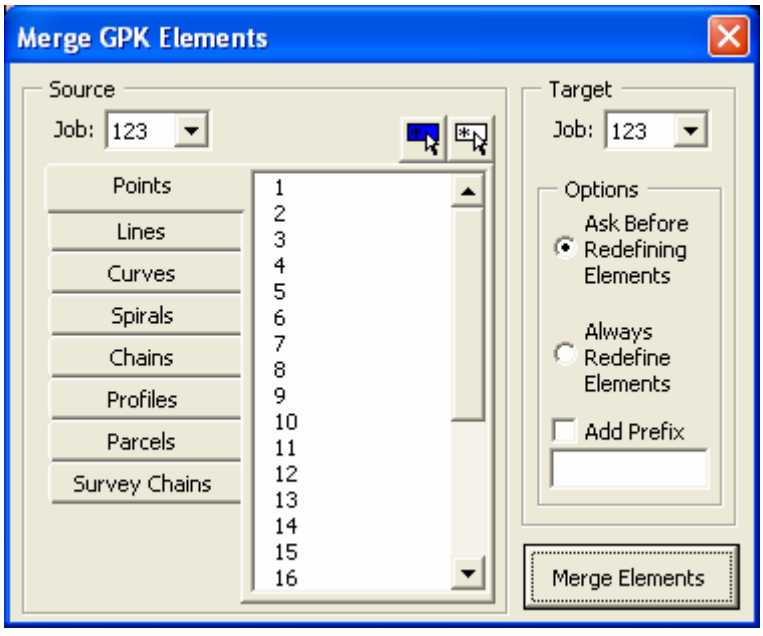


Figure 16-30: GPK Merge

XS Tapers - This MVBA is to assist the user in editing the tapers files (example: tapersIt.txt). By using this editor, the user will be assured not to deviate from the required format the criteria is expecting. The values put into this file will over ride the values set by the redefinable variables in the proposed cross section run.

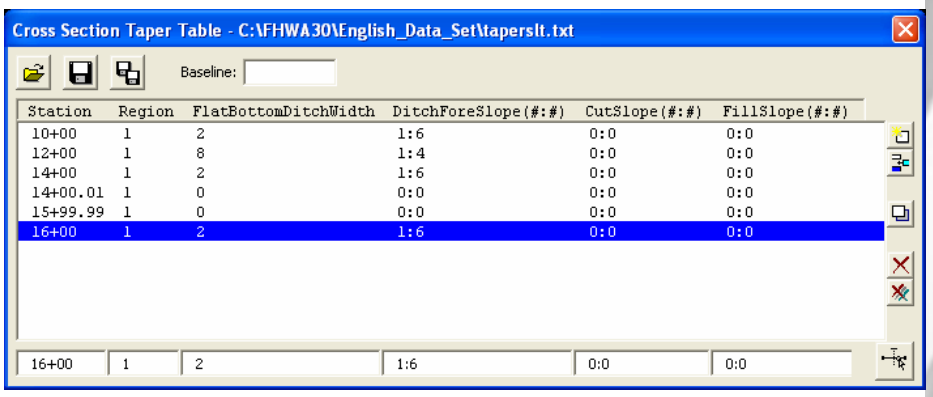


Figure 16-31: XS Tapers

More information on the tapering can be found in the *V8_Resource\X_30\Typicals\English or Metric\UnPavt.wri file* or by selecting Using The Tapers MVBA

Curve Widening - This MVBA is to assist the user in drawing curve widening lines in Accordance with the AASHTO guidelines. A valid autoshape input file is required for this MVBA.

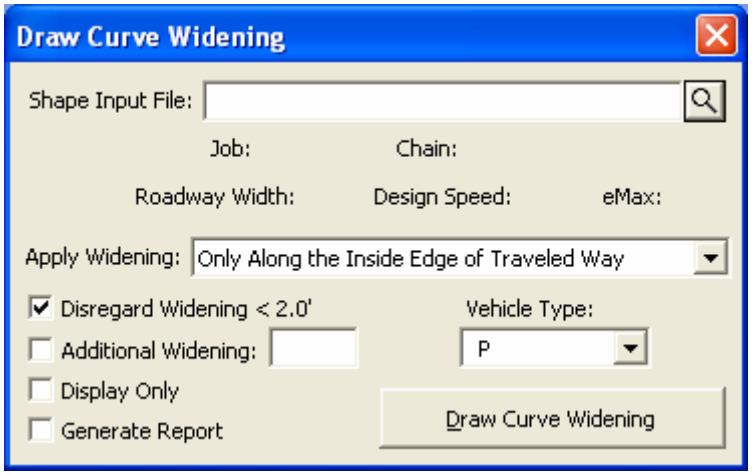


Figure 16-32: Curve Widening

More information on the curve widening MVBA can be found by selecting Curve Widening (Automatic Method)

Super Cross Section Navigator -This MVBA is an alternative application for reviewing cross sections. User can drive through the cross sections or review cross section one at a time. Setting the profile keeps the cross sections from moving up and down.

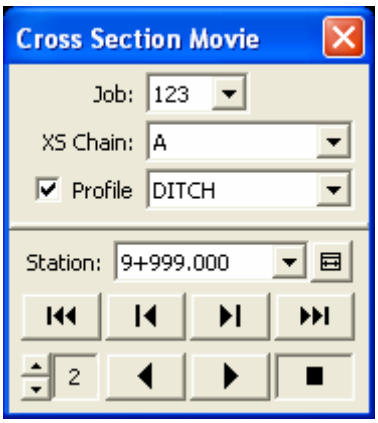


Figure 16-33: Cross Section Movie

Adhoc Report - This MVBA will provide a listing of all the adhocs and their attributes based on the selection Method. Report can be printed using a screen capture program (SnagIt) or saved as a .csv file.

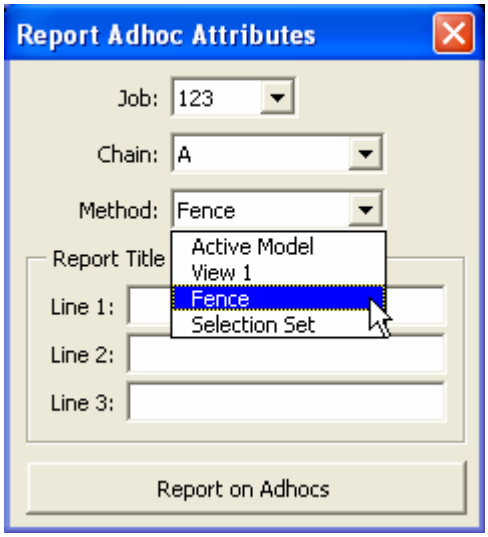


Figure 16-34: Adhoc Report

CFL Subgrade Template Report - This MVBA will produce new CFLHD standard Subgrade Template XS Reports. The Subgrade Template XS Report will replace CFLHD's previous Redtop Report and Detail Staking Report. More information on the Adhoc Report MVBA will be available on CFLHD Website.

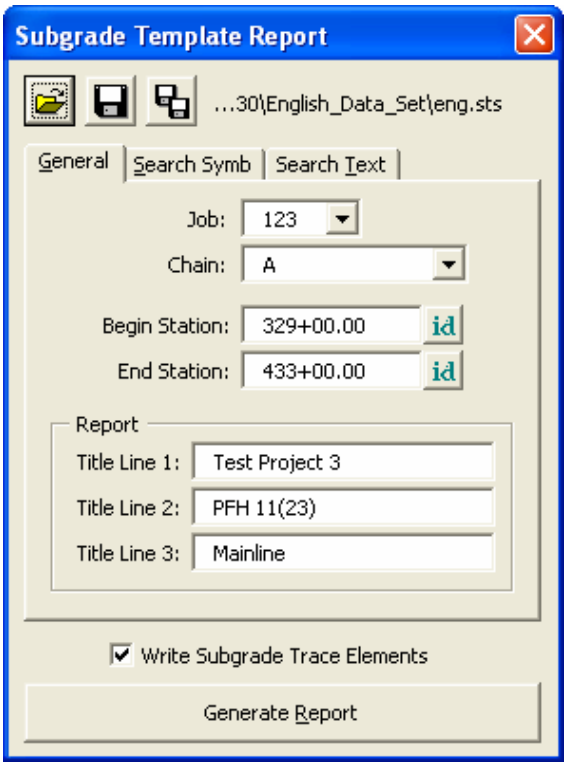


Figure 16-35: Adhoc Report

3PC Criteria in D&C Manager

Several 3PC applications can be launched through the D & C Manager.

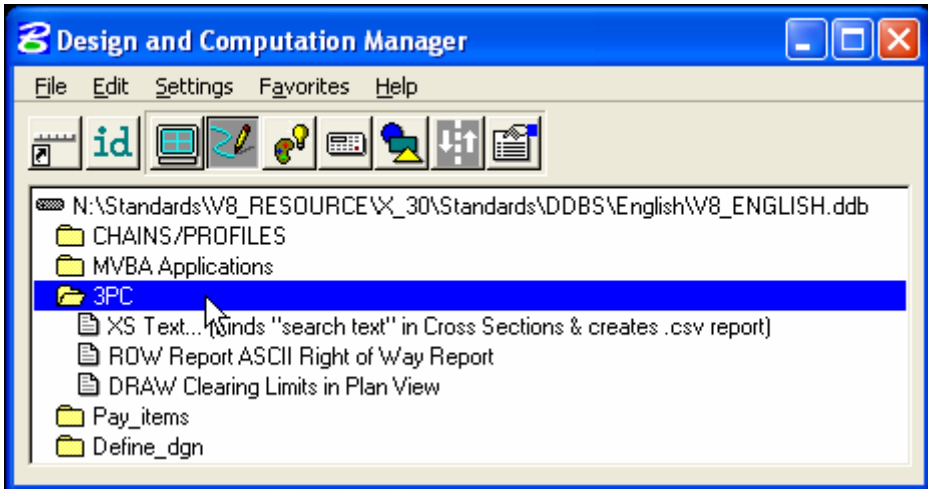


Figure 16-36: 3PC Applications

Listed below are the 3PC's available through the D & C Manager and their use.

XS Text - This 3PC will find all the "search text" elements in a cross section file and create a .csv report.

ROW Report - This 3PC will provide an electronic file for staking variety of Right of Way types. This 3PC was developed for WFLHD. More information on the ROW Report can be found by selecting ROW STAKING NOTES ..via 3PC

Draw Clearing Limits in Plan View - This 3PC draws clearing limit lines into a plan view dgn file based on the information from a standard Geopak Clearing Report.

Related links: The Design and Computation Manager using Knucklehead's Guide for GEOPAK Road 2004 Edition.